Amendments to the Specification

Please add this paragraph to the first page of the application:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a Divisional Application of U. S. Serial No. 09/776,403 filed February 2, 2001.

Please replace the paragraph beginning at page 6, line 9 with the following:

A seed or seed sample handling process and system includes automated handling of previously harvested seeds, by assigning or validating an identifier to a set of seeds, automatically performing one or more operations on the set of seed, and accumulating an end product and storing information about the end product correlated to the identifier. Optionally, the end product can be selected seeds of the set of seeds meeting certain pre-defined criteria. A possible feature of the invention includes validating the identity of a harvested seed sample, tracking the sample through a seed conditioning process, and ensuring its purity and identity as it is packaged. A still further possible feature of the invention includes deriving information about the seed sample during the conditioning process which can be correlated to the sample. As an example, a discrimination device or method can be used to analyze the seeds and discriminate between them or derive a characteristic of the seed, such as moisture. Optionally, the deriving information can be added to a pre-existing knowledge base about the seed from which the sample is taken and conditioned.

Please replace the paragraph beginning at page 8, line 26 with the following:

Figure 15 is a diagrammatic view of product line vac lines in the system of Figure 6.

Please replace the paragraph beginning at page 11, line 4 with the following:

Figure 33 is a side elevation view of Figure 29 showing the seed cleaners in a normal operating position.

Please replace the paragraph beginning at page 11, line 6 with the following:

Figure 34 is identical to Figure 33 but showing the seed cleaners in the self-cleaning position.

Please replace the paragraph beginning at page 14, line 14 with the following:

Instead of discrete manual sample handling and conveyance operations of each sample to process it for further use, system 10 automatically processes or conditions the sample seed.

Please replace the paragraph beginning at page 16, line 3 with the following:

Gates and doors are operated by electrically controlled pneumatic actuators (solenoid operated) referenced by PN1, PN2, PN3, PN4, PN5, PN6, PN7, PN8, PN9, PN10, PN11, PN12 and PN13. The actuators have two-way ported cylinders, they are actuatable to one of two states by placing higher pressure on one side of the cylinder ram and creating lower pressure on the other side relative to one state or the other. Many of these actuators hold gates or doors in a normally closed state, but when actuated, move a gate or door to an open state to create a pathway for seeds to pass. Several air jets are operated by electrically controlled actuators referenced by AJ1, AJ2, and AJ3. Examples of pneumatic cylinders that could be used are Models 6-DP-1-M, 6-DP-2-M, or 6-DP-3-M from Humphrey Products Company of Kalamazoo, Michigan; or model 2A710 pancake cylinders from Speedaire.

Please replace the paragraph beginning at page 21, line 9 with the following:

The central database can run as an application on an enterprise-wide network. A database utility takes information and puts it into Microsoft EXCEL files (or comma separated values (CSV) files) into a local Microsoft ACCESS database files, copied from a remote server. A small application communicates with controller 12 and gives information back to controller 12; and lets it process. When through, system 10/controller 12 picks up and sends information and time/date (and sequence #) to computer 14 which can generate a label.

Please replace the paragraph beginning at page 23, line 8 with the following:

System 10 is initialized. The operator sets parameters via keyboard or touch screen 15 associated with computer 14 or controller 12 for the particular product being processed. For example, certain types of corn have larger kernels than other types. Different settings on cleaner 30 and sorter 36 may be necessary for accuracy of the system. Such settings normally will have been calibrated by prior testing of system 10 with the same or similar type of seed.

Please replace the paragraph beginning at page 23, line 20 with the following:

Ear corn 19 can be dried in a system such as disclosed in U.S. Patent Application Ser. No. 09/498,277 to inventors Hunter, et al., bagged in bags 16, each of which can be bar code labeled as previously described (see Figure 2A, step 51). By scanning the bar code (step 53), information regarding the nature of the ear corn sample and the essential facts for records can be obtained by system 10 and stored in computer 14. The information can be displayed to an operator (step 54), and a decision can be made whether to shell corn or ship it on the ear (steps 56, 58). Note that a worker could at this point manually inspect the ear corn and reject it.

Please replace the paragraph beginning at page 25 line 17 with the following:

This flow of information on an enterprise wide basis is best shown in Figure 3B. Information including a shipping location, the year of the seeds, the season of the seeds, the location of the seed plots, a test plot identification number, seed experiment information, whether a particular seed sample is genetically modified, and other user-defined information that may be stored in an enterprise wide database 48 is then used in a local database 47. A database conversion utility may be required, for example the enterprise wide database information may be converted in part to a file of comma separated values or another universal format. A database utility may be required to import the information from a universal format to the format of local database 47. The local database 47 may be a Microsoft Access database and the database utility may be a stand-alone Microsoft Visual Basic application. The seed processing system 10 then adds information to the local database 47 during seed processing, the updated local database 47A containing this additional information. Once the database 47A has been populated with information from the seed processing system 10, the database utility can then be used to extract the database to a comma separated value (csv) file for loading into the enterprise wide database 48.

Please replace the paragraph beginning at page 26, line 13 with the following:

The database utility creates and uses a Microsoft Access database. As best shown in Figure 4, the database is made up of an Entries table, a Box table, and a BoxNumber table. The Entries table contains all of the sample data including the box ID the sample is stored in. The Box table contains all of the information for a box such as shipping weight and sample count. The BoxNumber table is used to build a new box entry in the Box table. The Box ID of the Box table is related to a data field in the Entries table. One field in the Entries table is related to the Box identifier of the BoxNumber table.

Please replace the paragraph beginning at page 33, line 26 with the following:

Discard or "dirty" seed flow: Seed that is too large to pass through scalping screen 260A slides across the scalping screen 260A onto lower pan 262B associated with the sieving screen 260B. This large seed or debris exits the cleaner at 268B. Seed that is too small is separated from the desirable seed by falling through sieving screen 260B onto sieving screen pan 262B and exits cleaner 30 comingled with large seed and debris using 268B.

Please replace the paragraph beginning at page 39, line 12 with the following:

Figures 32-34 show a dual staged flat-screened sizer with a seed cleaner such as illustrated in Figures 35 and 36. A housing 270 contains screen/cleaner 260A/262A in its upper portion positioned at a 10 degree angle relative to the horizontal plane, and screen/cleaner 260B/262B in its lower portion positioned at a 5 degree angle relative to the horizontal plane. These angles are selected to help seed move quicker over top screen 260A, and essentially allow screen 260A to be self-cleaning; while the smaller angle helps a longer residence time for seeds on bottom screen 260B. Screen 260A is held stationary in housing 270. Pan cleaner 262A is movable between a lowered or away position shown in Figure 33, to a position up into abutment with the bottom of screen 260A as shown in Figure 34.

Please replace the paragraph beginning at page 44, line 14 with the following:

Air transport 100 (Fig. 37B) is another pneumatic conveyor, with a tube operatively connected to a controller-controlled pressurized air source 34 that can lift seeds 25 vertically.

Please replace the paragraph beginning at page 49, line 14 with the following:

Discard or "dirty" (ejected) seed separated by color sorter 36 fall into a "dirty" seed funnel 112. The position of swap valve 113 (Figs. 41-44) determines if this collected "dirty" seed is sent via pneumatic transport tube 120 and line vac LV5 to trash cyclone 121 (see Fig. 15), or via transport tube 118 to bagging station 37. Swap valve actuator PN11 operates a slide plate 114 which has two openings 115A and B from which two tubular connectors extend, to which are

attached air transport tubes 120 and 118. In a trash cyclone position, plate 114 is slid to a position that allows discard seed access to transport tube 120. In a bagging position, plate 114 is slid to a position that allows the discard seed into transport tube 118. This is selectable by the operator and under control of controller 12. One opening 118 in fixed plate 119 is in fluid communication with line vac LV5. Slide plate 114 is slidable by actuator PN11 to either align its opening 115A or 115B with opening 118 in fixed plate 119.

Please replace the paragraph beginning at page 50, line 20 with the following:

Other characteristics of a seed 25 could also be remotely, non-destructively obtained in real time under controller control as the seed 25 is being conveyed in system 10. As shown in Figure 1, a near infrared spectroscopy device 36D could be used not only to measure moisture, but a variety of other characteristics. See U.S. patent 5,991,025, to Wright, et al., incorporated by reference herein. Other examples are nuclear magnetic resonance (NMR), and Raman spectroscopy. Examples of characteristics that can be non-destructively sensed in essentially real time include but are not limited to oil content, protein content, moisture, color chemical properties, genetic make-up, width, length.